

A new species of the genus *Antispila* Hübner (Lepidoptera, Heliozelidae), feeding on *Cleyera japonica* (Theaceae) from Japan

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Abstract *Antispila cleyerella* sp. nov. is described from Japan and a brief biological note is given. Larvae mining into leaves of *Cleyera japonica* (Theaceae) were collected in the gardens of the Imperial Palace, Tokyo, and in the precincts of Shinto shrines, in Aichi and Mie Prefectures. The family Theaceae has not been known as a host-plant of the Heliozelidae. Larval mines appeared in late March and adults emerged from late April to early May. Despite large numbers of reared larvae, emerged adults were all females. This species seems to be parthenogenetic.

Key words *Antispila cleyerella* sp. nov., *Cleyera japonica*, Heliozelidae, host plant, Imperial Palace, Japan, Lepidoptera.

Introduction

The family Heliozelidae are leaf miners through the larval stage and include several pests of fruit trees, such as grapes and apple. Larvae of *Coptodisca splendoriferella* (Clemens, 1859) mine into twigs of apple trees in America (Needham *et al.*, 1928). In Japan, *Antispila uenoi* Kuroko, 1987 is known as a pest of grapes (Ueno, 1987). At least 13 plant families including Vitaceae, Cornaceae and Fagaceae have been reported as host plants of Heliozelidae (Davis, 1999), but no heliozelid was known to utilize the family Theaceae.

During a faunal survey of moths conducted by the National Science Museum in the gardens of the Imperial Palace, Tokyo (Owada *et al.*, 2000), we collected larvae of unknown heliozelid species feeding in the leaves of *Cleyera japonica* (Theaceae). This species was also found in the precincts of Shinto shrines in Aichi and Mie Prefectures. Examination of the emerged adults revealed that it is a new species belonging to the genus *Antispila* Hübner.

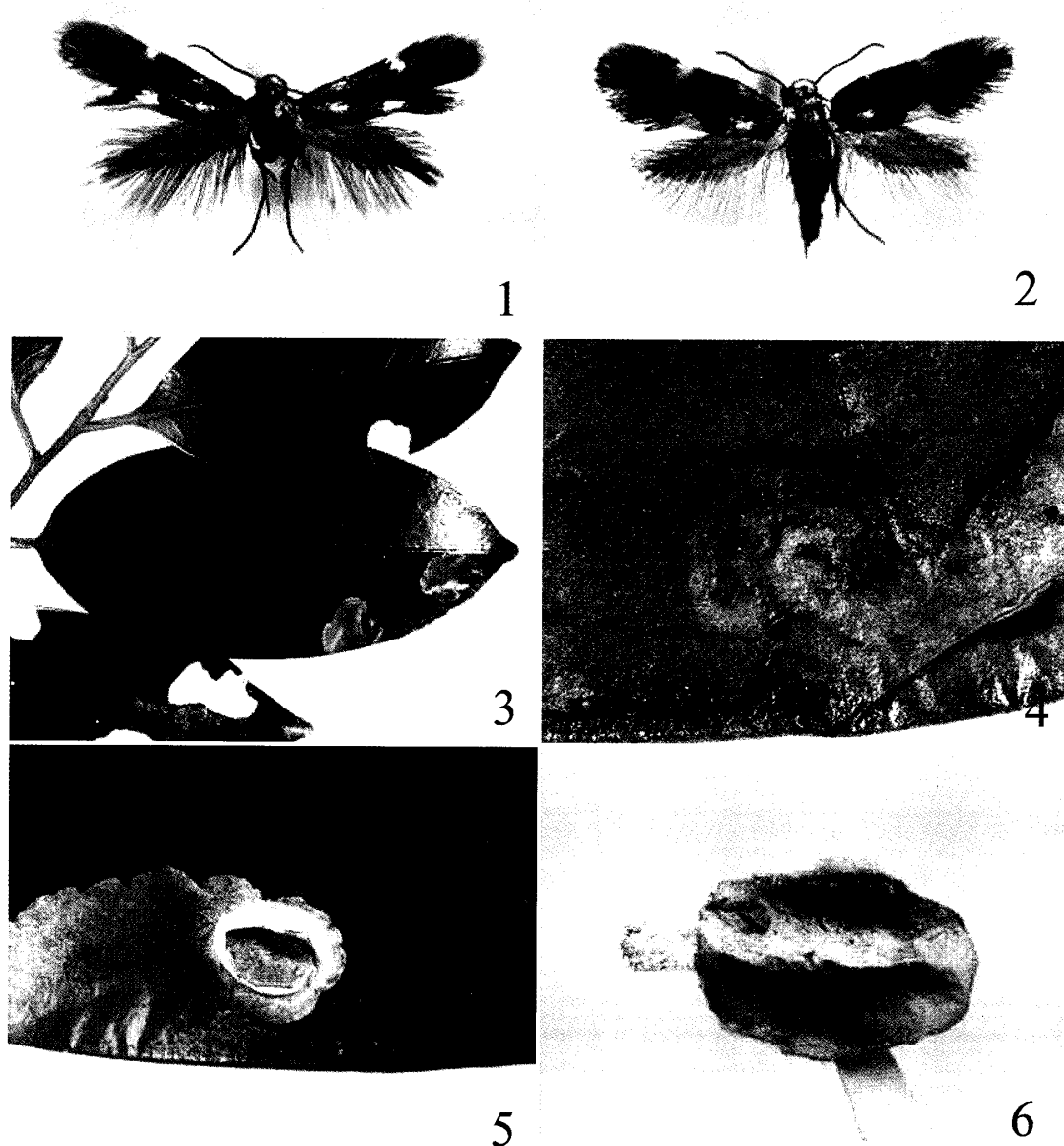
In the present paper, the new species is described on the basis of adults and a brief biological note is also given.

Materials and methods

A total of 170 adult specimens were used for this study. All of them were reared from larvae mining in leaves of *Cleyera japonica* (Theaceae), which were mainly collected in Tokyo (the gardens of the Imperial Palace), Aichi, and Mie Prefectures in March and May from 2002 to 2004. The larvae were reared in plastic containers with wet cotton in the laboratory near natural condition (25°C, 12L12D).

Terminology follows Razowski and Wojtusiak (1978) and Kuroko (1982, 1987) for adult, and Stehr (1987) for larva.

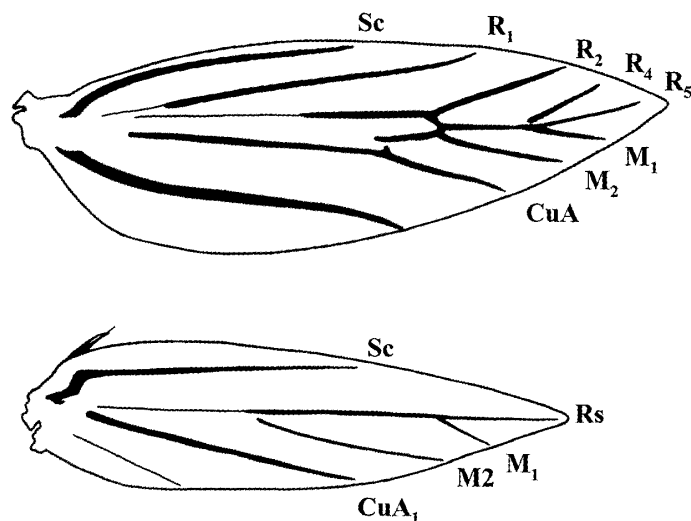
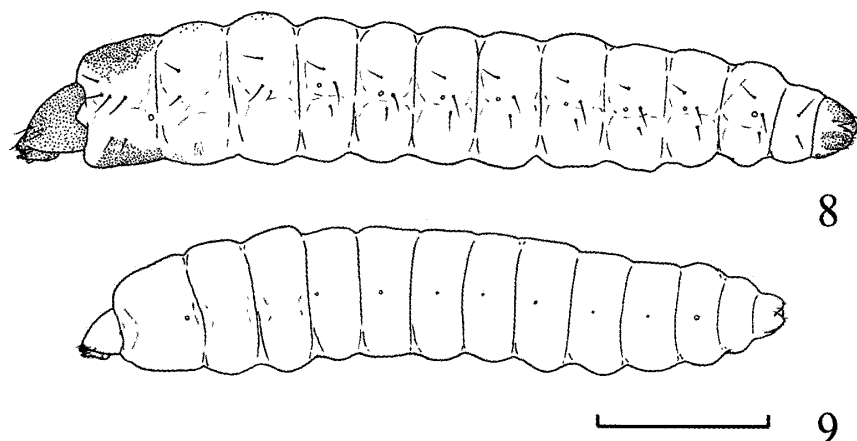
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Figs 1–6. Adults, mines, and cases of *Antispila cleyerella* sp. nov. 1. Holotype (female). 2. Paratype (female). 3. Mines on the leaves of *Cleyera japonica*. 4. Mine of earlier stages. 5. Mine with a case. 6. Case.

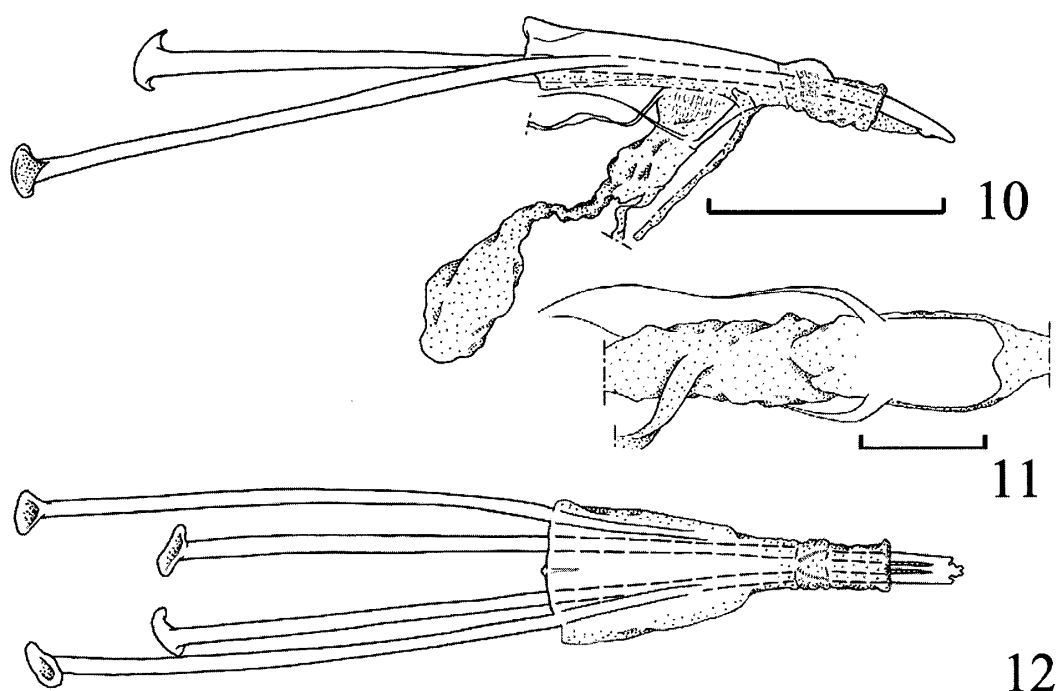
***Antispila cleyerella* Lee, sp. nov.**

Adult. Female (Figs 1–2, 7). Forewing length 2.8–3.3 mm (holotype 3.0 mm, including cilia). Head: bronzy-fuscos with brassy reflections; frons smooth and bronzy; antenna reaching about 1/2 of forewing, scape dark fuscous with ochreous ventrally; flagellum fuscous with purple reflections; maxillary palpus fuscous, reduced in length, geniculated with 4 segments; labial palpus with 3 segments, 3rd segment pale ochreous. Thorax: dark fuscous with brassy reflections; tegula dark fuscous. Legs: fore coxa dark fuscous with long scale tuft; fore femur and tibia dark fuscous; fore tarsus dark fuscous, terminal 4 segments

Fig. 7. Wing venation of *Antispila cleyerella* sp. nov.Figs 8–9. Larvae of *Antispila cleyerella* sp. nov. 8. Penultimate (4th) instar. 9. Final (5th) instar. Scale 1 mm.

pale ochreous ventrally; mid femur ochreous with brassy reflections; pale fuscous with brassy reflections; mid tibia dark fuscous with 2 spurs; mid tarsus dark fuscous with purple reflections dorsally, terminal 4 segments ochreous with fuscous scales ventrally; hind femur ochreous with brassy reflections; hind tibia dark fuscous with 4 spurs and tufts; hind tarsus dark fuscous, terminal 2–4 segments ochreous with fuscous scales ventrally, terminal segment ochreous. Abdomen: dorsal part dark fuscous with purple reflection, ventral part fuscous with ochreous from 2 to 6 segments medially.

Forewing with 9 veins, Sc, R_1 and R_2 as normal in the genus, but R_4 , R_5 and M_1 branched at almost same point; dark fuscous with purple reflections, spots silvery-metallic with golden reflections, a triangular inner dorsal spot on 1/4 faintly connected with a quadrangular small inner costal spot on 1/4, inclined outwardly, a triangular outer costal spot small, curved outwardly, a large triangular outer dorsal spot on 1/2 reaching 1/3 across wing, cilia dark fuscous with purple reflections. Hindwing with 5 veins, all veins as normal in the genus, dark fuscous basally; cilia fuscous.



Figs 10–12. Female genitalia of *Antispila cleyerella* sp. nov. 10. Lateral view. 11. Vestibulum, ventral view. 12. Terminalia, dorsal view. Scales 0.5 mm (Figs 10, 12), 0.1 mm (Fig. 11).

Female genitalia (Figs 10–12). Seventh tergite and sternite well sclerotized. Eighth tergite weakly sclerotized, triangular shaped, tapering terminally, posterior part spirical; sternite membranous. Ovipositor flatted dorsoventrally, 5 teeth, apical tooth divided into 2 parts. Apophyses almost equal length, anterior end disk-shaped. Vestibulum a shield-shaped sclerite postventrally. Corpus bursae ellipsoidal, without signum.

Male. Unknown.

Larva. Penultimate (4th) instar larva (Fig. 8). 4.6–5.3 mm in length. Head: width 0.64–0.68 mm, dark brown, well sclerotized. Thorax: thoracic legs absent. Dorsal and ventral parts of prothorax slightly sclerotized to form a thoracic shield. Meso- and metathoracic parts weakly sclerotized, milky white. Abdomen: prolegs and crochets absent. Almost unsclerotized except 10th segment. Tenth segment sclerotized on dorsal and lateral parts, dark brown; ventral sclerite seperated into two parts.

Final (5th) instar larva (Fig. 9). 3.7–4.6 mm in length. Head: width 0.46–0.50 mm, capsule milky white, weakly sclerotized, pigmented only at mouth-parts. Thorax: thoracic legs absent, entirely unsclerotized, milky white. Abdomen: prolegs and crochets absent, unsclerotized, unpigmented; anal shield absent.

Case (Figs 5–6). Elliptical, flattened, disk-shaped, with a longitudinal central ridge on the surface of each case; upper and lower parts different in size, lower one about 1.5 mm larger than upper; upper part about 6×4.5 mm in size.

Specimens examined. Holotype (Fig. 1). ♀, Fukiage-gyoen, Imperial Palace, Tokyo, Japan, *ex Cleyera japonica*, emerged (em.) 23. IV. 2003, Y. Arita, M. Ikeda & U. Jinbo, genitalia slide no. LBW 139, deposited in the National Science Museum, Tokyo. Paratypes. 4 ♀, same locality as holotype, em. 22–24. IV. 2003, Y. Arita, M. Ikeda & U. Jinbo; 2 ♀,

Imperial Grounds, Akasaka, Tokyo, em. 27. IV., 1. V. 2004. Y. Arita & M. Owada; 22 ♀, Rokushosan, Toyota-Shi, Aichi Pref., mine: 10. IV. 2003, em. 13. V–2. VI. 2003, B. W. Lee & H. Mizukawa; 12 ♀, Nagoya-Shi, Aichi Pref., mine: III. 1979, em. 11–15. V. 1979, Y. Arita; 10 ♀, Igakanbe, Ueno-Shi, Mie Pref., mine: 13. III. 2002, em. 27. IV–2. V. 2002, Y. Arita & B. W. Lee; 33 ♀, mine: 22. III. 2003, em. 8–12. V. 2003, Y. Arita & B. W. Lee; 21 ♀, mine: 13. III. 2004, em. 28. IV–4. V. 2004, B. W. Lee & H. Mizukawa; 26 ♀, mine: 20. III. 2004, em. 30. IV–24. V. 2004; Y. Arita, B. W. Lee & H. Mizukawa. Additional material. 4 ♀, Imperial Grounds, Akasaka, Tokyo, em. 5–9. V. 2003, Y. Arita & U. Jinbo; 28 ♀, mine: 13. III. 2004, em. 18–22. IV. 2004, B. W. Lee & H. Mizukawa; 8 ♀, mine: 20. III. 2004, em. 21–24. V. 2004; Y. Arita, B. W. Lee & H. Mizukawa.

Host plant. *Cleyera japonica* Thunb. (Theaceae).

Distribution. Japan, Honshu (Tokyo, Aichi and Mie Prefectures).

Etymology. The specific epithet, *cleyerella*, derives from the generic name of the host plant, *Cleyera japonica*.

Biology. Univoltine. Larvae of this species appear in the middle of March at lower elevations and in the middle of April in mountainous areas. The 1st instar larvae mine into the blade of host plants and make a spiral linear mine (Fig. 4). After 2nd instars, larvae make a blotch mine in full-depth (Fig. 3). The 4th instar larva cuts out oval flat sections of the case from the upper and lower epidermis of one end of mine and the case drops on the ground (Figs 5–6). The 1st to 4th instar larvae are feeding stages, but the 5th instar is a non-feeding stage. The moths emerged from late April to early May in the same year in the laboratory.

Remarks. The new species is very similar to *A. purplella* Kuroko, 1961, but differs distinctly from it in the smaller size (forewing length less than 3.2 mm, while more than 3.2 mm in *A. purplella*), the bronzy frons, the pale ochreous 3rd segment of labial palpus, the pale fuscous femur with brassy reflections, the triangular dorsal spot on 1/2 of wing being larger than the costal one, and in the female genitalia the membranous vestibulum has a shield-shaped sclerite postventrally.

We collected many larvae of this species from several localities in Tokyo, Aichi and Mie Prefectures. In fact, this species seems to have been accommodated in such habitats as the gardens of the Imperial Palace and the precincts of Shinto shrines, where the hostplant *Cleyera japonica* is planted for the purpose of Shinto ceremony usage. We (Lee and Hirowatari) also collected the mines of this species on *C. japonica* in natural forests of Kawakami-mura, Nara Prefecture, and Ms M. Murase (Wakayama City; *pers. comm.*) collected old mines in the coppice of Kainan City, Wakayama Prefecture. However, we did not include these localities in the distributional data of this species because no adult was obtained by rearing to confirm the identification.

Although we obtained 170 adults of the new species through rearing, all of them were female. This fact might indicate that this species is parthenogenetic.

Acknowledgments

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摘 要

幼虫がサカキに潜る日本産 *Antispila* 属の1新種(鱗翅目, ツヤコガ科) (李 峰雨・広渡俊哉・黒子 浩・有田 豊)

ツヤコガ科の幼虫はほとんどが潜葉性で、終齢の前に葉の上下の表皮を切り取ってケースを作る。また、ブドウ類に潜るブドウキンモンツヤコガ *Antispila uenoi* Kuroko のように栽培作物の害虫も含んでいる。寄主植物としてはこれまでブドウ科、ミズキ科、ブナ科など13科の植物が知られていたが、ツヤコガ科の寄主植物として知られていなかったツバキ科のサカキに潜る未知種が皇居等で発見されたので新種として記載した。

Antispila cleyerella Lee, sp. nov. サカキツヤコガ (新種)

本種は東京都(皇居)、愛知県(六所山)、三重県(伊賀神戸)などで確認された。本種の幼虫は平地では3月中旬に、山地では4月中旬にサカキの葉に斑状潜孔を形成し、飼育下で同年4月下旬から5月上旬に成虫が羽化した。著者らは数年間に170個体の幼虫を採集・飼育したが、羽化したのはすべて雌であった。このことから、本種は単為生殖をしている可能性がある。

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